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LXXXII. *Microscopical Observations : In a Letter from Edward Wright, Esq; to Mr. Peter Collinson, F. R. S. dated at Paris, Decemb. 26, 1755.*

Read Mar. 18, 1756. **I**T appears from Mr. Needham's experiments, and those of Monf. de Buffon, that animal and vegetable substances infused in boiling water, put into bottles completely filled, and so closely stopped, that no air can enter, and even kept for some time in hot ashes, that in case there should be any latent ova of insects, they may effectually be destroyed; it appears, I say, from the experiments of these gentlemen, that such substances, notwithstanding such precautions, afford microscopical animalcules of various kinds, and that sooner or later, according to the greater or less degree of exaltation in the substances. Hence they conclude, that there is a real productive force in nature, by which these animalcula are formed.

Having read the accounts of these experiments, I was desirous to make some of the same kind, which I accordingly did, in the summer of the year 1752.

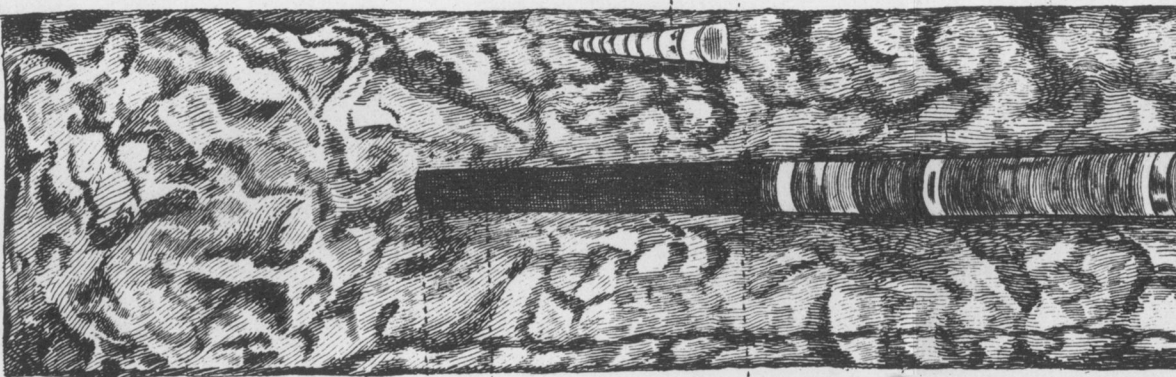
Though the greatest part of the animal substances, upon which I made any experiments treated in the manner above-mentioned, yielded, sooner or later, great numbers of microscopical animalcules; yet most of the vegetable substances, whether from the coldness of the season, which was not very favourable that year with us, or for some fault in preparing the infusion, intirely failed, and underwent a fermentation

tion, without ever giving the smallest marks of any thing endowed with life.

As I had little leisure, my experiments were neither so numerous nor so well managed, as I could have wished ; nor did I take notes of the event of any, except that of two, which I made upon millepedes and cantharides, substances much used in medicine, which renders observations upon them so much the more interesting.

May 1st, 1752, at eleven o'clock forenoon, I made an infusion of dried millepedes, or wood-lice, such as are commonly kept in our apothecaries shops. These I put unbruised into a small phial, so as to make it half full ; then poured upon them as much boiling water as filled it neck and all, stopped it with a well masticated cork, and put it into a pocket, where it was kept in a mild degree of warmth. I let it remain till ten o'clock the same evening, when I examined a drop of the infusion with the highest magnifier of a very good microscope made by Mr. Clarke of Edinburgh. I found the whole swarming with oblong, slender, flattish pellucid animalcules, pretty nearly of the same breadth throughout the whole length of their bodies, and without any appearance of a tail (*see* TAB. XXII. Fig. I.) all evidently of the same kind, though not all of the same length and dimensions, extremely vivid, and, as appeared pretty evident to me, spontaneous in their motions, which they performed in all directions in an undulatory, vermicular way.

Upon observing the speedy appearance of these animalcules, I wished to know, in how short a time they might be produced ; for which purpose,



*Fig. 3.*

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*E. Wright delin.*

*J. Mayne & Co.*

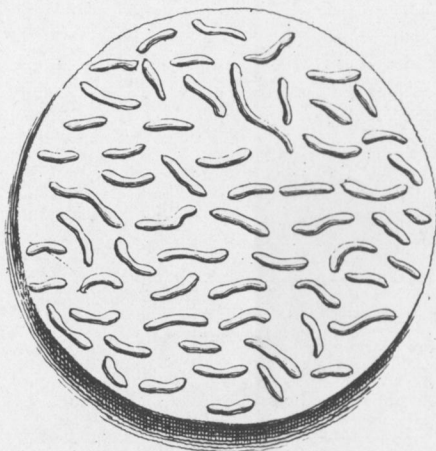
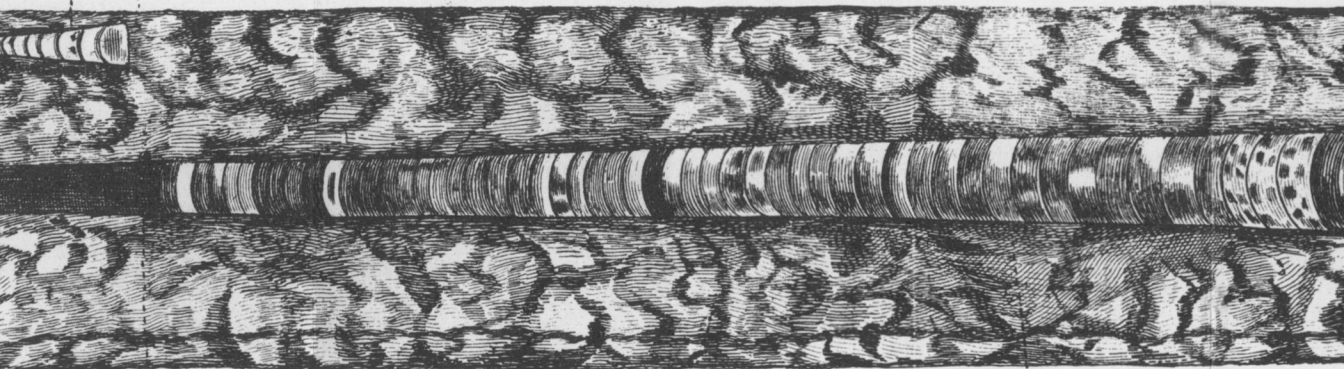


Fig. 1.



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Fig. 3.

Fig. 2.

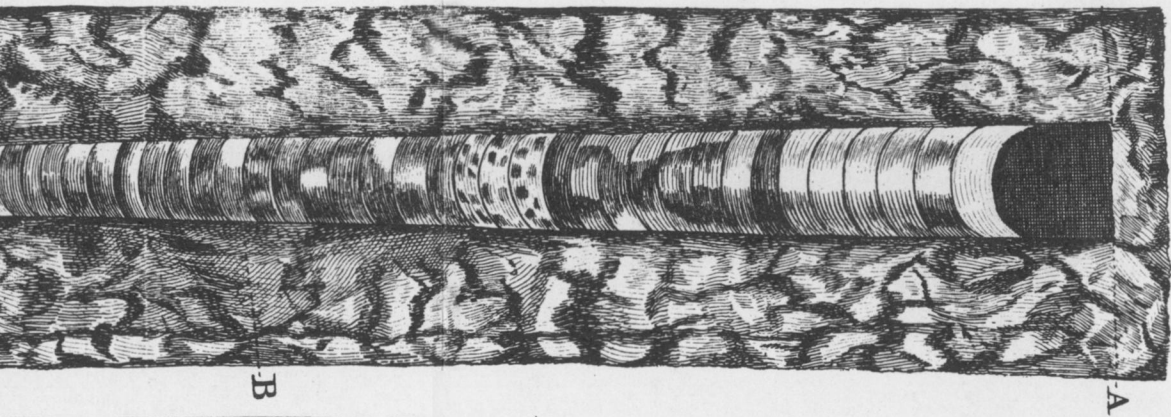


Fig. 1.



May 3d, I made just such another infusion, put it into my pocket, as before, and an hour afterwards laid a drop of it before the microscope, while it was as yet milk warm. I observed a very few of these minute bodies moving about briskly in the fluid. An hour after this more of them appeared; and before the end of the third hour, the infusion contained a great number of them. They continued however to increase in numbers for an hour or two afterwards, when the infusion seemed to have produced all that it was capable of.

June 3d. I made an infusion in the same way of unbruised cantharides, and in much about the same time found the whole swarming with animalcules of the same kind as those of the infusion of millepedes.

These bodies, which at first appeared larger than those in semine masculino, were very soon decomposed into smaller ones, to speak according to the doctrine of Mess<sup>rs</sup>. Needham and Buffon, or, as others would rather incline to express it, succeeded by smaller ones, these again by others still smaller, and so on, until in a few days, the highest magnifier of my microscope could exhibit nothing distinct to the eye.

The same substances infused in rectified spirits of wine, or other spirituous liquors, shewed none of these bodies, and a few drops of such liquors, or of a solution of fixt or volatile alkaline salts poured into the infusions, instantly destroyed the animalcules.

I shall not take up time in enquiring, whether these animalcules are produced by the decomposition of the substances, in which we observe them, which, according to Mons<sup>r</sup>. de Buffon contain a number of  
living

living organic particles, or, according to Mr. Needham, a vegetating force in every microscopical point, capable of forming secondary combinations, microscopical plants, zoophytes or animalcules, according to the greater or less degree of exaltation, which the several substances have attained. Or whether they proceed from ova formerly existing in the substances, and capable of enduring a great degree of heat, without being destroyed, the germs of which are sooner or later developed according to the fitness of the nidus, as is the opinion of the learned and ingenious Dr. Parsons, in his treatise of the analogy between the propagation of animals and that of vegetables.

As by entering into a discussion of these different sentiments, one might write a large volume without perhaps going to the bottom of the matter, I shall here only observe, that whichever of these opinions we embrace, thus far seems to be certain, that the earlier or later appearance of microscopical animalcules is always in proportion to the degree of tendency to putrefaction in such substances as afford them. This is the case not only with them, but likewise with maggots in meat, which all the world knows to be produced from the eggs of flies.

The two substances millepedes and cantharides, upon which the above observations were made, are remarkably putrescent, and the infusions of them stunk abominably in a very short time.

Castor, though an animal substance, and seemingly very much exalted, treated in the same manner as the above-mentioned substances, viewed by the microscope every day, and kept for several months, afforded no animalcules, nor seemed to have under-



undergone the smallest change; which confirms what the ingenious Doctor Pringle has observed, that it is antiseptic; and adds weight to the observation, which I made above, that the appearance of such animalcules denotes a tendency to putrefaction. Hence I am of opinion, that such microscopical observations made with care and accuracy, might be usefully applied in the investigation of the septic and antiseptic qualities of animal and vegetable substances, since in this way the first motion of putrefaction may be discovered before it manifests itself otherwise.

As every one would wish, if possible, to render his studies or observations (however philosophical, or otherwise agreeable they may be) in some shape subservient to the good of mankind, here seems to be pointed out a new and interesting field of enquiry for those, who delight in microscopical researches.

Before I conclude, I must beg leave to subjoin a few remarks concerning exaltation, which seem to deserve attention.

All exaltation appears to be a certain modification of the salts and oils of bodies: a proper degree of it favours growth and vegetation, and sustains animal life: a greater degree of it, which I would call the putrefactive exaltation, and to which all organized bodies tend more or less, decomposes all such bodies, and favours the production of microscopical animalcules, or the developement of the ova, from whence they may be hatched. A still higher degree of exaltation puts a stop to this process, as likewise to vegetation, and in certain circumstances even to animal life, as happens with regard to all acrid

chemical preparations, &c. whether of the animal or vegetable kingdom.

Those, who imagine, that all salts and oils hurt the vegetating force of matter, have fallen into a great error; for from whence can such a vegetating force proceed, but from a due mixture and modification of the salts and oils with the earthy principle, which all the world allows to be of itself inert?

It is true indeed, that a very large portion of salts or oils renders substances antiseptic, or very slow either of vegetation or putrefaction, as is well known with regard to sea-salt, a large quantity of which preserves substances from putrefaction; though, as the learned Dr. Pringle observes, a smaller one rather forwards that process, as it does likewise vegetation. Castor, which as I formerly observed, is antiseptic, seems to owe this quality to nothing else but a large quantity of a sluggish fetid oil, which it contains.

LXXXIII. *An Account of a Cure of a paralytic Arm, by Electricity: In a Letter from Cheney Hart, M.D. to Mr. William Watson, F.R.S.*

Salop, March 20, 1756.

Read Mar. 25, 1756. **T**Hough 'tis a long time since I had occasion to write to you, yet I take the liberty of now troubling you with a letter, to acquaint you with the case of a young woman I lately have had under my care at the infirmary here, upon whom